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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,198	12/08/2006	Wataru Hisada	2471A/114	8917
2101 7590 09/11/2009 Sunstein Kann Murphy & Timbers LLP 125 SUMMER STREET BOSTON, MA 02110-1618				
EXAMINER PENNY, TABATHA L				
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4171				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,198

Applicant(s)

HISADA ET AL.

Examiner

TABATHA PENNY

Art Unit

4171

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
Paper No(s)/Mail Date 5/12/2006, 6/15/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This is the first office action on the merits.
2. The preliminary amendment filed on 5/12/2006 has been entered and fully considered. Claims 1-10 are pending of which 3-9 were amended.

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

5. The abstract of the disclosure is objected to because of undue length. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 1-4, 8, and 10 rejected under 35 U.S.C. 103(a) as being obvious over GRANT (US Pat. 3,821,018) in view of MOTOYAMA *et al.* (US Pat. 4,556,175).

10. **Regarding applicants' claim 1**, GRANT discloses a method of forming a porous metallic layer by providing a loose coating comprising a metal matrix powder, bonding metal alloy powder, and an inert liquid binder vehicle onto a copper base material (GRANT column 2 lines 38-41). GRANT discloses that the step of providing the loose coating contemplates all method of application without appreciable external pressure, for example spraying (GRANT column 7 lines 6-13). GRANT further discloses rotating the base material as needed to insure complete coverage (GRANT column 9 lines 28-29) then heating the copper base material, covered with a loose coating, to evolve the liquid binder (GRANT column 2 lines 60-63) and melt the bonding metal alloy to enable it to braze together the base material and matrix powder (GRANT column 3 lines 12-17). GRANT does not explicitly disclose agitating particles by centrifugal fluidization while injecting the prepared coating fluid; however, MOTOYAMA *et al.* discloses a coating machine for coating particles in the field of powdered metals and ceramics utilizing centrifugal fluidization to agitate the core particles while a prepared coating mixture is injected through a nozzle (MOTOYAMA column 1 lines 53-57, column 7 lines 35-36, column 6 lines 27-30). MOTOYAMA *et al.* further discloses that the coating machine offers control of bulk density, hardness, and particle size of the granulated products, and can obtain, with high productivity, the granulated products of high quality (MOTOYAMA column 2 lines 33-37). At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to modify the rotating of base material of GRANT with the centrifugal fluidization of MOTOYAMA *et al.* to improve the control and quality of the finished product.

11. **Regarding applicants' claim 10**, modified GRANT discloses a method of forming a porous metallic layer by injecting a loose coating comprising a metal matrix powder, bonding metal alloy powder, and an inert liquid binder vehicle onto a copper base material while the base material is being agitated utilizing centrifugal fluidization. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. MPEP 2112.01(i), In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). "When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not." MPEP 2112.01(i), In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).
12. **Regarding applicants' claim 2**, modified GRANT discloses a method of obtaining a metallic layer on a core particle utilizing centrifugal fluidization while injecting the coating fluid. GRANT does not explicitly disclose heating the particles during centrifugal fluidization; however, MOTOYAMA *et al.* discloses centrifugal fluidization and heating of the particles using a gas which is heated or cooled to a desired temperature by a heat exchanger for drying the coating material (MOTOYAMA column 1 lines 32-36, column 5 lines 11-17). MOTOYAMA *et al.* further discloses, in an example of pharmaceutical manufacture, a gas temperature of 80°C (MOTOYAMA column 9 line 28). The temperature for evaporating the liquid from the coating material can be adjusted with respect to the liquid being evaporated. Generally, differences in

concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) MPEP 2144.05(II)(A). At the time of the invention, it would have been prima facie obvious to one of ordinary skill in the art to use the heating of particles, taught by MOTOYAMA *et al.*, in the method of modified GRANT at the appropriate temperature in order to evaporate the liquid from the coating materials.

13. **Regarding applicants' claim 3**, modified GRANT discloses a method of obtaining a metallic layer on a core particle utilizing centrifugal fluidization wherein the coating solution is injected onto the core particles; further, MOTOYAMA *et al.* discloses spraying a coating solution through nozzles for coating the particles to reach a desired particle size (MOTOYAMA column 5 lines 51-54). MOTOYAMA *et al.* is silent as to what flow rate is used for injecting the coating material; however, MOTOYAMA's nozzles are capable of regulating the flow of coating onto the particles to obtain a desired particle size and coating thickness because nozzles are a projecting part with an opening specifically for regulating and directing fluid flow ("nozzle." *The American Heritage® Dictionary of the English Language, Fourth Edition*. Houghton Mifflin Company, 2004. 01 Sep. 2009. <Dictionary.com <http://dictionary.reference.com/browse/nozzle>>). "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine

experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955), MPEP 2144.05(II)(A). At the time of the invention, it would have been prima facie obvious to one of ordinary skill in the art to use the injection of coating material through nozzles, taught by MOTOYAMA et al., in the method of modified GRANT at the appropriate flow rate to obtain the desired particle size and coating thickness.

14. **Regarding applicants’ claim 4**, modified GRANT discloses a method of obtaining a metallic layer on a core particle utilizing centrifugal fluidization wherein the core particles are heated to evaporate the liquid binder and; further, GRANT discloses that suitable binders must be liquid at ambient temperature, inert (or chemically non-reactive) with respect to the other components, and preferably have a moderately high volatility and low latent heat (GRANT column 6 lines 37-45). GRANT also discloses a liquid binder diluted with an appropriate solvent (GRANT column 6 lines 50-54). GRANT does not explicitly disclose a 4% binder-solvent mixture; however, use of a diluted fugitive organic binder is well known in the art (US Pat. No. 4,257,904 and 4,435,189; US 20020058179) and dispersed organic binders such as polyvinyl alcohol, polyvinyl pyrrolidone, acrylates or methacrylates, etc. are available in various trade names in amounts up to about 5% (US Pat. No. 3,637,406, column 4 lines 46-50).

15. **Regarding applicants’ claim 8**, modified GRANT discloses a method of heating base material coated with loose coating. GRANT discloses this heating is conducted in a non-oxidizing atmosphere to evolve the liquid binder and further melt the bonding metal alloy to enable it to braze together the base material and matrix powder (GRANT column 2 lines 60-65, column 3 lines 15-18). GRANT further discloses that the

expression "non-oxidizing atmosphere" means a gas atmosphere containing insufficient oxygen to permit oxidation of the base material, plating powder, or bonding metal at the elevated temperature (GRANT column 2 lines 65-68, column 3 lines 1-2). Using GRANT's definition of a non-oxidizing atmosphere at less than 350°C or less than 50°C below the starting temperature of the oxidation of the plating powder air is also a non-oxidative atmosphere.

16. Claim 5-7 and 9 rejected under 35 U.S.C. 103(a) as being obvious over GRANT (US Pat. 3,821,018) in view of MOTOYAMA *et al.* (US Pat. 4,556,175) further in view of ASANUMA *et al.* (JP 08-257914).

17. **Regarding applicants' claim 5**, modified GRANT discloses a method of obtaining a coating on a core particle. GRANT does not explicitly disclose a plating powder consisting of an electrically conductive ceramic of a specific size; however, ASANUMA *et al.* discloses a core particle with ceramic particles adhered to the surface by a metal (ASANUMA claim 1). The ceramic plating powder, taught by ASANUMA *et al.*, would have been capable of conducting electricity. ASANUMA *et al.* also teaches a small ceramic particle size for alumina powder with a mean particle diameter of 28 micrometers (ASANUMA paragraph [0009]). A prima facie case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties. MPEP 2144.05(I); Titanium Metals Corp. of America v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985). ANSANUMA *et al.* further discloses that ceramics have a higher hardness than the previously taught metals (ANSANUMA paragraph [0005]). At the

time of the invention, it would have been prima facie obvious to one of ordinary skill in the art to use the ceramic plating powder, taught by ASANUMA *et al.*, in the method of modified GRANT to increase the hardness of the resultant plating material.

18. **Regarding applicants' claim 6**, modified GRANT discloses a method of obtaining a ceramic coating on a core particle using ceramics having a mean particle size of about 20 micrometers. GRANT discloses a plating powder and metal powder in particulate form of the same size (GRANT column 2 lines 37-40). GRANT further discloses that the melting temperature of the metal powder, below 1,500°F, is lower than that of the core particles, above 1,500°F (GRANT column 3 lines 59-60 and column 2 lines 30-32).

19. **Regarding applicants' claim 7**, modified GRANT discloses a method of obtaining a coating on a core particle using ceramics having a mean particle size of about 20 micrometers. GRANT further discloses a hard metal alloy core particle, copper alloy (GRANT column 2 lines 30-32). GRANT does not explicitly disclose a core particle with an average diameter of 2 mm or less; however, ASANUMA *et al.* discloses a core particle coated with a zinc alloy and ceramic powder, for use in blasting (applicant's disclosed use), wherein the mean particle diameter of the core particle was 0.5 mm (ASANUMA paragraph [0009]). At the time of the invention, it would have been prima facie obvious to one of ordinary skill in the art to use the core particle size, taught by ASANUMA *et al.*, in the method of modified GRANT to obtain the appropriate particle size for blasting.

20. **Regarding applicants' claim 9**, modified GRANT discloses a core particle encapsulated by a metal binder and ceramic plating powder. GRANT does not explicitly disclose the ratio of plating powder and metal powder to core particle; however ASANUMA *et al.* discloses a volume ratio of zinc metal bonding agent to iron core particles of 1:1 and a ratio of alumina to zinc of 5-30 % by volume (ASANUMA paragraph [0008]). Further, ASANUMA *et al.* discloses adjusting the volume ratio of ceramic powder to obtain the optimal practical use and improve the economical efficiency (ASANUMA paragraph [0012]). Volume percent and mass percent are both variations on percentage concentration. Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. "[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In *re* Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) MPEP 2144.05(II)(A). At the time of the invention, it would have been *prima facie* obvious to one of ordinary skill in the art to optimize the ratios, taught by ASANUMA *et al.*, in the method of modified GRANT to obtain optimal practical use of the end product and improve the economic efficiency of production.

Conclusion

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to TABATHA PENNY whose telephone number is

(571)270-5512. The examiner can normally be reached on Monday thru Friday 8:00am-4:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571)272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/tp/

/Barbara L. Gilliam/

Supervisory Patent Examiner, Art Unit 4133